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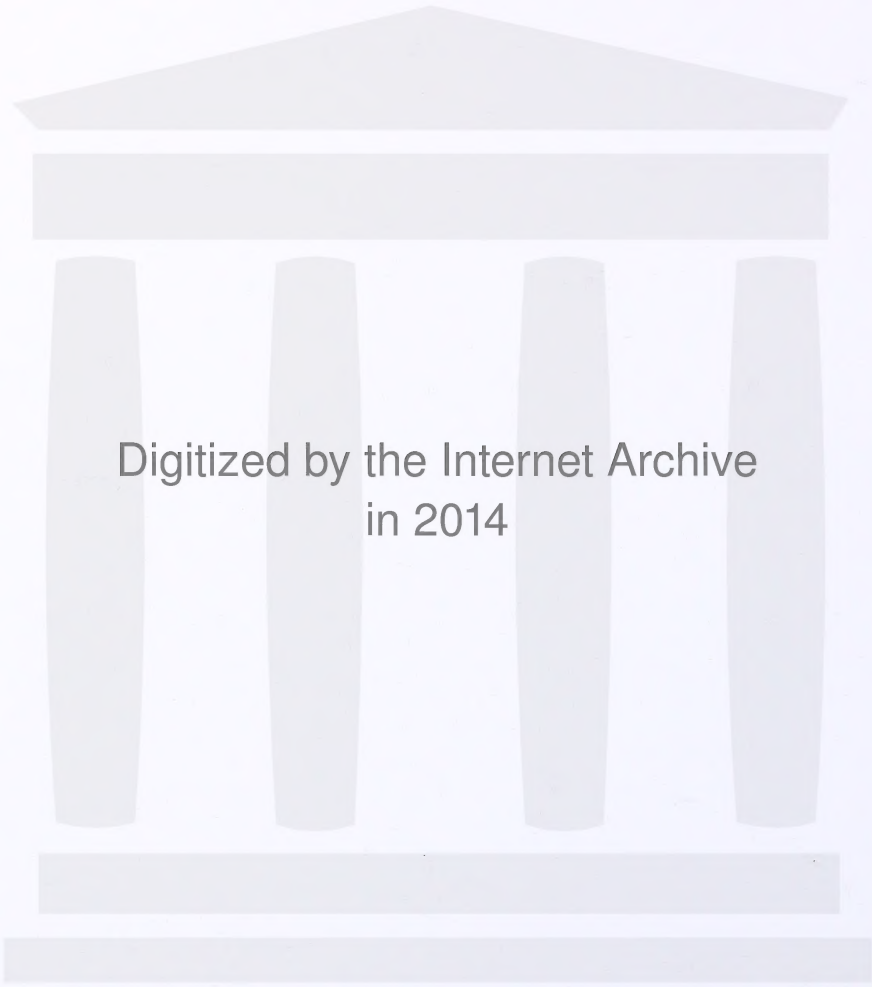
ALBERTA HERITAGE FOUNDATION FOR MEDICAL RESEARCH

The Second Triennial Report 1983-1986

(PART II: REPORT OF THE INTERNATIONAL BOARD OF REVIEW)



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THE SECOND TRIENNIAL REPORT PART II

A review of the operation of the Alberta Heritage Foundation For Medical Research for the period 1980 - 1986

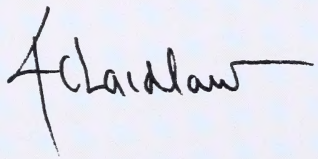
Prepared for the
Alberta Heritage Foundation
For Medical Research
by the
International Board of Review

Mr. E.A. Geddes, Chairman
Alberta Heritage Foundation
for Medical Research
3125 Manulife Place
10180 - 101 Street
EDMONTON, Alberta
T5J 3S4

Dear Mr. Geddes:

The seven members of the International Board of Review, as appointed by the Trustees in accordance with section 23 of the Act, have examined the operation of the Alberta Heritage Foundation for Medical Research for the period 1980 to 1986. As Chairman of the Board, I respectfully submit to the Trustees the enclosed report containing our review and recommendations.

Yours sincerely,



John C. Laidlaw, Chairman
International Board of Review

86/10/21

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SUMMARY

The Alberta Heritage Foundation for Medical Research (AHFMR) was established in 1980 by the AHFMR Act of the Provincial Government. The objectives of the Foundation were to:

(a) stimulate research in the medical sciences,
(b) implement effective means of using in Alberta the scientific resources available in medical sciences,
(c) support medical research laboratories and related facilities in Alberta,
(d) promote cooperation in research in medical sciences in order to minimize duplication in, and promote concentration of, effort in that research, and
(e) encourage young Albertans to pursue careers in research in the medical sciences.

Under Section 23 of the AHFMR Act, an International Board of Review (IBR) was to appraise the operation of the Foundation at intervals of six years once the Act came into force. The Board of Trustees of the Foundation established the first IBR in the winter of 1985 and instructed it to produce a report on the first six years of the AHFMR:

(a) commenting on the *impact and effectiveness* of the present program of grants and awards in achieving the main objectives of the Foundation,
(b) recommending, if required, *modification* of the present program of grants and awards,
(c) recommending consideration of *new programs* of grants and awards to achieve the main objectives of the Foundation in the most efficient way.

The International Board of Review met in 1986 on three occasions:an orientation meeting in February, a three day visit to Edmonton in May including a two day site visit to The University of Alberta and a three day visit to Calgary in July including a two day site visit to The University of Calgary.A review of observations was prepared after the third meeting. The following is a Summary of this review.

A

The Programs of the Foundation and Their Impact on Research, Education and Patient Care

Five highly impressive programs have been launched in the period 1980-86.

1. The *Personnel Establishment Programs* provide personal support for internationally recognized scientists (Heritage Medical Scientists) and for well-trained investigators of promise who have recently completed training (Heritage Medical Scholars and Clinical Investigators). Establishment Grants providing operating funds and equipment for two to three years are available to these scientists.

2. The *Training Programs* provide support for research training: for students taking graduate studies in a medically related discipline (Full-time Studentships); for doctoral graduates of science and health professional programs to take further training in medical research (Full-time Fellowships); for health professionals who have finished their clinical training (Clinical Fellowships); for Alberta clinical faculty who wish to gain experience in clinical epidemiology and biostatistics (Clinical Traineeships); and for undergraduate students who wish to pursue medical research on a part-time basis (Summer Studentships and Part-time Studentships and Fellowships).

3. The *Research Support and Infrastructure Programs* provide support for travel for Alberta faculty; Visiting Professorships; Conferences and Workshops and Major Equipment. As well as providing a contribution to The Universities of Calgary and Alberta towards the general administrative costs associated with the management of Foundation supported medical research conducted within the Universities, the Foundation also provides support for renovation of laboratory space, medical libraries, computer equipment, technical workshops, animal facilities, recruitment costs, secretarial support, and installation of Foundation-funded equipment.

4. The *Technology Transfer Program* gives Alberta scientists and engineers the opportunity to promote university-industry collaboration.

5. Finally, the Foundation has provided funds for a *Heritage Medical Research Building* at each of The Universities of Alberta and Calgary to house new multidisciplinary research groups with "bench to bedside" objectives.

The impact of these five programs on medical research in Alberta has been truly remarkable. Some 98 highly talented Heritage Scientists, Scholars and Clinical Investigators have been recruited to the two Faculties of Medicine. These investigators comprise 20 per cent of the full-time faculty of the two institutions. Over one-half of these recruits have been attracted to Alberta from outside — from other parts of Canada, from the U.S., and from other countries. The attraction has been based on the opportunity to collaborate with first-class scientists in many disciplines, the preservation of research time, the availability of establishment grants and the ability of the research training programs to attract first-rate graduate and postdoctoral students. The high calibre of these investigators is evident from the following: Of those Scholars and Scientists who have completed their Establishment Grants, 94 per cent have obtained operating funds on first application to Canadian national research agencies with high quality peer review systems. This is a truly impressive record when one considers that only 30 per cent of other first applicants to these agencies from Canada as a whole receive such support.

During 1980 - 86 some 272 Full-time Studentships and 318 Full-time Fellowships have been awarded in the two Faculties of Medicine. Over 70 per cent of these trainees have taken their previous training outside of Alberta. The attraction to Alberta has been based on the high calibre of the research supervisors, the quality and variety of visiting scientists, the research facilities available and the unique terms of the traineeships. The record of the graduates of the Full-time Studentship and Fellowship programs in pursuing further training or obtaining academic positions is impressive. The clinical research training programs are more recent in origin but they already show promise.

In the Technology Transfer Program, nine projects ranging from the development of new drugs to the design of lasers for surgical therapy are presently being supported.

While the Heritage Medical Research Buildings are not yet in operation, it is clear that without them, the development of new multidisciplinary research groups would be difficult if not impossible. It is imperative that such groups be established if Alberta is to be at the forefront of modern medical research.

It is important to note that Faculties other than Medicine have benefited from one or more of the Foundation's programs:Science, Pharmacy, Dentistry, Nursing, Social Sciences, Physical Education, Home Economics, Engineering and Agriculture.

In short, a remarkable milieu for medical research and research training has developed as a result of the recruitment of an unusual mix of talented investigators and students and the support of research through establishment grants, grants for visiting scientists, conferences and workshops. There is no question that international recognition of The Universities of Alberta and Calgary has been greatly enhanced by the AHFMR programs.

It is clear too that the influx of high calibre enthusiastic investigators is having a major impact on undergraduate, graduate and postgraduate *education.*

Patient care has already benefited from the Scholars, Scientists and Clinical Investigators. First, a number of these researchers are expert clinicians in areas which previously have not been covered well in Alberta. Second, the research of a number of these investigators has begun to have an impact on the prevention, diagnosis and treatment of disease. And third, because of their expertise, a number of non-clinical researchers have become indispensable members of clinical teams.

B

Recommendations Regarding the AHFMR Programs

No new programs are proposed although it is urged that the Scientific Advisory Council play an even more active role in developing new initiatives.

There are a series of recommendations regarding such issues as the facilitation of the recruitment of high quality Scientists, Scholars and Clinical Investigators; the orientation of,

and the participation of, non-medical Faculties in the new multidisciplinary research groups; the support of patient-based research; the number of representatives of non-medical Faculties in Alberta, and the number of scientists from outside Alberta, on peer review committees; turnover and continuity of membership of the Board of Trustees; and the relationship of the Foundation with the Provincial Government.

There are two major recommendations. The first is designed to ensure the maintenance of vigour, innovation and excellence in the Foundation's research program beyond the initial period of rapid growth. The future success of the Medical Scientist and Scholarship programs is critically dependent on continued self renewal by the recruitment of new investigators. To this end the IBR favours a rigorous review for all Scholars after their initial five year appointment and it should be generally understood that only those who have made a significant contribution to their fields will be appointed to a second five year term. It should similarly be understood that only the very best Scholars will be appointed as Heritage Medical Scientists and that a proportion of the Medical Scientists will be recruited from outside the Heritage Foundation program. Moreover, since the distinction of the entire program is to a large extent dependent on the continued productivity of the Medical Scientists, their progress should be carefully reviewed at intervals of no more than five years; only those whose work remains at the forefront of their respective fields should continue to be supported. Since these recommendations are likely to have important implications for The Universities of Alberta and Calgary, they should begin to consider what alternative opportunities can be developed for Scholars and Scientists who are no longer supported by the AHFMR but whose other contributions (e.g.,to teaching, to clinical service, or to administration) are judged to be valuable.

The second major recommendation concerns the Endowment of the AHFMR. The IBR strongly supports the Foundation's plans for a steady state group of approximately 200 Scholars, Scientists and Clinical Investigators with the ancillary training and research support described above. It is recommended that the Endowment of the AHFMR be increased in order that the proposed programs can be effectively maintained.

The International Board of Review admires the foresight and enterprise which in 1980 led Premier Peter Lougheed and the Provincial Government to establish the Alberta Heritage Foundation for Medical Research. We commend Dr. J. E. Bradley for his contributions as Executive Director of the Foundation from July 1980 to November 1982. And we congratulate the Foundation's Board of Trustees, its first President Dr. Lionel McLeod, and the Scientific Advisory Council for their leadership in establishing programs which have had a remarkable and profound effect in improving the quality and status of medical research in Alberta, and indeed in the rest of Canada as well.

The Alberta Heritage Foundation for Medical Research (AHFMR) was established in 1980 by the AHFMR Act of the Provincial Government (Chapter A-26, Revised Statutes of Alberta, 1980). Under Section 23 of the Act an International Board of Review was to be appointed in the following manner.

(1) Within 3 months of the receipt of a written request by the Foundation made not later than October 1, 1984, the Scientific Advisory Council shall forward to the Foundation nominations of persons for membership in an International Board of Review of a number specified in the Foundation's request.
(2) The Foundation shall, within 3 months of receiving the nominations of the Scientific Advisory Council under subsection (1), appoint an International Board of Review of not less than 6 members from among those persons nominated by the Scientific Advisory Council each for a term not exceeding 6 years.
(3) Subsequent members of the International Board of Review shall be nominated by the Scientific Advisory Council and appointed by the Foundation in the same manner as the initial appointments made under subsections (1) and (2).
(4) The members of the International Board of Review appointed under subsections (2) and (3) shall review the operation of the Foundation at intervals of 6 years after the coming into force of the Act and shall report and make recommendations to the Foundation on the Foundation's operations.
(5) Notwithstanding subsections (2) and (3), the appointments of the members of the International Board lapse on the passing of a resolution of the Foundation, made after the receipt by the Foundation of the report and recommendations of the International Board of Review under subsection (4), discharging the members from further duties.

In accord with the above an International Board of Review (IBR) was established in December 1985 with the following members:

Dr. Andre Archambault (formerly Vice-President, Academic Affairs, University of Montreal)
Currently Professor
Health and Pharmacy Administration
University of Montreal

Dr. Robert Berliner, (formerly Dean, Yale Medical School)
Currently Director, PEW Program
Yale University School of Medicine
New Haven, Connecticut

Dr. Maxwell Cowan, (formerly Vice-President, Salk Institute for Biological Studies)
Currently Provost
Washington University, St. Louis

Prof. H.J. Evans
Director, MRC Clinical and Population
Cytogenetics Unit University of Edinburgh

Dr. Edwin G. Krebs
Senior Investigator
Howard Hughes Medical Institute
University of Washington Medical School
Seattle, Washington

Dr. Robert B. Salter
Professor and Head
Orthopedic Surgery
The Hospital for Sick Children, Toronto

Dr. J.C. Laidlaw (formerly Dean, Faculty of Health Sciences, McMaster University and Scientific Advisor to the President of the Medical Research Council)
Currently Executive Director (Medical Affairs)
Canadian Cancer Society, Toronto

The following terms of reference for the IBR were approved by the Board of Trustees of the AHFMR on December 12, 1984. The Board shall:

1. **Review the Foundation's programs of grants and awards** according to the main objective of the Foundation to establish and support a balanced long-term program of Medical Research in Alberta directed to the discovery of new knowledge, and the application of that knowledge to improve the health and quality of health services in Alberta.

In so doing, the Board shall pay particular reference to the objects of the Foundation, which are to:

(a) stimulate research in medical sciences,
(b) implement effective means of using in Alberta, the scientific resources available in medical sciences,
(c) support medical research laboratories and related facilities in Alberta,
(d) promote cooperation in research in medical sciences in order to minimize duplication in,

and promote concentration of, effort in that research, and

(e) encourage young Albertans to pursue careers in research in medical sciences.

2. **Provide a report to the Trustees of the Foundation** by June 30, 1987

(a) commenting on the *impact and effectiveness* of the present program of grants and awards in achieving the main objectives of the Foundation,

(b) recommending, if required, *modification* of the present program of grants and awards,

(c) recommending consideration of *new programs* of grants and awards to achieve the main objectives of the Foundation in the most efficient way.

The IBR met in 1986 on three occasions. The first in Toronto on February 5th was with officers of the Foundation, Mr. E. A. Geddes (Chairman, Board of Trustees), Dr. L. E. McLeod (President), Dr. J. Colter (Alberta member of the Scientific Advisory Council) and Mrs. Terrie Pawsey (Administrative Assistant to Dr. McLeod). This meeting was called to review the terms of reference of the IBR and to provide information on the Foundation's mandate and programs and the kinds of material being gathered to assist the IBR in its review. The second meeting was a three day (May 20-22) visit to Edmonton including a two-day site visit to The University of Alberta and the third a three day (July 9-11) visit to Calgary including a two-day site visit to The University of Calgary. The itinerary for each site visit is in Appendix 1. In short at each University the IBR met a President or Vice President, Faculty Deans, Associate Deans, Department Heads/ Chairmen, Program Directors, Heritage Scientists, Scholars and Clinical Investigators, and holders of Heritage Studentships and Fellowships.

The IBR is deeply indebted to Dr. L. E. McLeod for his unfailing cooperation, encouragement and assistance. Mr. E. A. Geddes was particularly helpful at the first meeting of the IBR in describing the genesis and organization of the Foundation and the perspectives of the Board of Trustees. Mr. Kim Lim provided us with an immense amount of valuable information which Dr. John Colter ably edited and refined. We are very grateful to them. We thank all of those whom we interviewed. Their cooperation and candour helped us understand the remarkable impact of the Foundation. Finally we are grateful to Mrs. Terrie Pawsey who ensured that the arrangements for our meetings were unusually smooth.

The following is a brief description of the programs of the Foundation along with quantitative information relating to each program for the period 1980-86. A more detailed description of the programs may be found in the booklets "AHFMR Guidelines for Grants and Awards", "Major Personnel Awards" and "Curriculum Vitae and Bibliographies of Heritage Medical Scientists, Scholars and Clinical Investigators". Very detailed quantitative information on the programs was provided by Mr. Kim Lim of the Foundation, which Dr. John Colter ably edited and refined; this may be found in volumes 1, 2 and 3 of the "Report to the International Board of Review".

I Personnel Establishment Programs

These programs provide salaries and fringe benefits for investigators who wish to have a career in medical research.

Heritage Medical Scientists

This program is designed to assist the recruitment and establishment in Alberta of experienced and highly productive medical scientists who have achieved national and international recognition for the quality of their research and its importance to the advancement of medical knowledge. The initial award is for five years. It may be renewed.

Heritage Medical Scholarships

This program is designed to assist the recruitment and establishment in Alberta of well trained and talented medical scientists who have recently completed their training and have a record of independent and superior research but less than that which would warrant a Heritage Medical Scientist award. The initial award is for five years. The award may be renewed for one further five year period.

Heritage Clinical Investigatorships

This program is designed to provide funding for highly qualified clinicians who are prepared to commit a large majority of their time to gain further research experience. This experience must be supervised by an established basic or clinical scientist. Prior to application the candidate should have completed at least two years of supervised medical research training. The initial award is for three years. It may be extended for a further two years.

Table 1 illustrates the distribution of these awards for the period 1980-86.

TABLE 1
Distribution of AHFMR Awards

	PROGRAM		
	Scientist	Scholar	Clinical Investigator
University of Alberta			
Faculty of Medicine	3	26	4
Science	—	4	—
Pharmacy	—	1	—
Home Economics	—	1	—
Agriculture/Forestry	—	1	—
University of Calgary			
Faculty of Medicine	8	55	2
Science	—	3	—
Social Science	—	1	—
TOTAL	11	92	6

In summary, 109 AHFMR Scientists, Scholars and Clinical Investigators have been appointed over the six year period, 98 of these in the Faculties of Medicine. As an indication of the potential impact of these programs, during 1985-86 33 (14%) of the 250 full-time equivalent faculty of The University of Alberta Faculty of Medicine were Heritage Scientists, Scholars or Clinical Investigators. The comparable figure for The University of Calgary Faculty of Medicine is 65 (27%) of the 240 full-time equivalent faculty.

It is of interest to note that over one half of the 109 Scientists, Scholars and Clinical Investigators have been attracted to Alberta from outside:24 Americans from U.S. universities, 16 investigators from other countries (10 of these from the United Kingdom, Australia or New Zealand) and 19 Canadians from universities in other parts of Canada. In addition, 11 former Albertans were returned to the Province and 19 individuals

(either in training or on limited funding) were retained in Alberta by the availability of the programs of the Foundation.

An important component of the Personnel Establishment Programs is the *Establishment Grant*. This provides support for research operating expenses and major equipment for a period of two to three years. After this period, the investigator is expected to obtain such support from other agencies, e.g., the Medical Research Council, the National Cancer Institute, the Canadian Heart Foundation, etc. All of the Heritage Scientists (11) and Clinical Investigators (6) and almost all of the 92 Heritage Scholars have received Establishment Grants. All (8) of the Scientists and 70 of the 75 Scholars who have completed their first two to three years while on an Establishment Grant have obtained operating support from Canadian national research agencies with high quality peer review systems. It is important to note that this record is much more impressive than that of other first applicants to these agencies.It is common for only 30 per cent of the latter applicants to be awarded operating grants.This record of AHFMR-supported investigators is a remarkable testament to their quality and to the quality of their research programs.

Independent Establishment Grants

Independent Establishment Grants have been provided on a competitive basis to other new medical scientists in Alberta. During 1980-86 such grants have been given to 18 scientists in the two Faculties of Medicine and to 13 in other Faculties (Science 7; Dentistry 4; Physical Education 1; Social Sciences 1).

II Training Programs

Heritage Studentships

Full-time Studentships are designed to enable academically superior students to pursue a science program in a medically-related discipline leading to a masters or doctoral degree. In the period 1980-86 there have been 473 awards (273 and 191 at The Universities of Alberta and Calgary respectively and 9 to Albertans to study out-of-province).

Part-time Studentships are designed to enable students enrolled in a full-time health professional degree program in Alberta to continue research training on a part-time basis during the regular academic year. To date there have been 39 awards, 23 at The University of Alberta and 16 at The University of Calgary.

Summer Studentships are designed to enable undergraduate students with strong academic records to participate in medical research in the summer months to encourage them to consider formal research training. In the period 1980-86 there have been 685 awards (440, 226 and 19 at The Universities of Alberta, Calgary and Lethbridge respectively).

Heritage Fellowships

Full-time Fellowships are designed to enable highly qualified doctoral graduates of science and health professional programs to take further training to prepare for careers in medical research. To date there have been 502 awards (75 out-of-province and 245, 180 and 2 at The Universities of Alberta, Calgary and Lethbridge respectively).

Part-time Fellowships are designed to enable students holding a science Ph.D. and registered in a health professional program in Alberta to continue active involvement in research during their professional education. There have been 6 such awards at The University of Alberta, 22 at The University of Calgary and 1 out-of-province award.

Clinical Fellowships are designed to provide research training to health professionals who have finished their clinical subspecialty training. To date there have been 23 such fellowships at The University of Alberta and 16 at The University of Calgary.

Heritage Clinical Traineeships

This is a new program designed to enable Alberta clinical faculty with prior training in medical research to obtain vigorous training in clinical epidemiology and biostatistics. One such award has been made and the clinician is training in the United States.

III Research Support and Infrastructure Programs

Faculty Travel and Visiting Lectureships

Annual grants are awarded to the Presidents of The Universities of Alberta and Calgary to support the travel of medical scientists to scientific meetings and medical research centres and to support scientific visitors to Alberta's medical research laboratories. Some $2.4 million has been spent on this program since 1981.

Heritage Visiting Professorships

These are awarded by the Trustees of the Foundation to distinguished medical scientists for visits of *up to seven days* to Alberta's medical research laboratories to contribute to the education and training of Students and Fellows and to promote the progress of medical research in Alberta. To date a total of 61 awards have been made, 43 to The University of Alberta and 18 to The University of Calgary.

Heritage Visiting Scientists

This program provides funding for visits of three to twelve months for productive medical scientists. The visitor *to Alberta* is meant to bring expertise not available within the sponsoring institution. The visitor *from Alberta* is meant to obtain experience in new concepts and technology at a major medical research centre. Visiting Scientists *to* The Universities of Alberta and Calgary have numbered 45, those *from* the two Universities 21.

Conferences and Workshops

Conference grants provide funds for distinguished medical scientists to participate in panels which communicate to Alberta's medical scientists and health professionals knowledge arising from recent important research. The Workshop Program enables groups of Alberta and visiting scientists to plan collaborative research programs or evaluate recent breakthroughs in research. Some 90 Conferences and Workshops have been supported by the Foundation since 1980 (cost $1.4 million).

Major Scientific Equipment Program

An annual competition is offered to assist Alberta's medical scientists to obtain major scientific equipment. Some $10 million has been spent on this program during the period 1980-85.

Infrastructure Programs

The AHFMR provides a contribution to The Universities of Calgary and Alberta towards the general administrative costs associated with the management of Foundation-supported medical research conducted within the Universities.

In addition, funds have been made available to renovate laboratory space for Heritage Scientists, Scholars and Clinical Investigators; to upgrade the medical libraries of The Universities of Alberta and Calgary; to upgrade computer resources; to provide technical support for workshops that design and make scientific equipment; to upgrade animal resources; to contribute towards secretarial support; to contribute towards recruitment; and to install and maintain Foundation-funded equipment.

IV Technology Transfer Program

This program was established to provide the opportunity for Alberta's medical scientists and engineers to promote university-industrial collaboration and support applied research to the point where private investors might provide seed capital. At present nine projects which range from the development of new drugs to the design of lasers for surgical therapy are being supported.

V Heritage Medical Research Buildings

In 1984 the AHFMR Scientific Advisory Council concluded that new multidisciplinary medical research groups could not be established in the absence of new and appropriate laboratory space. As neither of The Universities of Alberta or Calgary were able to generate funds for the construction of new space, and as the Foundation would have to consider the payment of substantial rental costs for commercial space, the Trustees

THE PEER REVIEW SYSTEM

agreed to provide funds for 5,000 net square metres of research space at both The University of Alberta and The University of Calgary. The facilities would be connected to the principal teaching hospitals and would house major multidisciplinary research groups based upon existing or readily developable basic science strengths. Proposals for such groups would be submitted to the Scientific Advisory Council for approval. These proposals were to provide evidence of a major scientific focus for each group and of "bench to bedside" objectives for the research. The Foundation would retain the right of approval of space allocation for ten years. Both The University of Alberta and The University of Calgary named the building 'Heritage Medical Research Building'.

At the time of writing, the buildings at both of the Universities are under construction. Proposals for the multidisciplinary research groups submitted by committees from each of the Universities are being reviewed by the AHFMR Scientific Advisory Council.

The applications for support from the various AHFMR programs are assessed by nine advisory committees. The composition and responsibilities of these committees are shown in Table 2.

TABLE 2
Applications Advisory Committees Composition and Responsibilities

APPLICATION RESPONSIBILITY	COMPOSITION From University of Alberta	From University of Calgary	From Outsi Alber
	Applications Reviewed by Scientific Advisory Council		
1 **Scientists** (Appointment & Renewal) **Groups in Heritage Medical Research Buildings**	2	2	8
2 **Scholarships**	3	3	1
3 **Scholarship Renewal**	3	3	1
4 **Clinical Investigators Clinical Fellows Clinical Trainees**	3	3	1
5 **Studentships**	4	3	0
6 **Fellowships**	3	3	0
7 **Major Equipment**	4	3	0
8 **Visiting Professorships Visiting Scientists Conferences, Workshops**	2	2	0
9 **Technology Transfer****	0	1	1

** The present membership of the Technology Transfer Advisory Committee consists of three members of the Board of Trustees (one from each of Edmonton, Calgary, and Red Deer), one industrialist from Edmonton and one from Calgary, one medical scientist from The University of Calgary and one medical scientist from the U.S.

Of the eight members of the current Scientific Advisory Council (SAC) who are non-Albertan, 4 are Canadian, three are from the U.S. and one is from the U.K. The President of the Foundation chairs the SAC and the committee concerned with Visiting Professorships, Visiting Scientists, Conferences and Workshops. Of the current Alberta members on the Advisory Committees 1 to 8, 44 are scientists from the two Faculties of Medicine and three are scientists from other Faculties (one from the Faculty of Science and one from the Faculty of Pharmacy on the Studentship Committee and one from the Faculty of Dentistry on the Major Equipment Committee).

Establishment Grant applications are assessed as follows: Independent Establishment Grant applications and those for Scholars by the Scholarship Committee; those for Scientists by the SAC; and those for Clinical Investigators by Committee No. 4.

Members of review committees generally serve for two years in staggered fashion thus ensuring a flow of fresh assessors.The Scientist, Scholar and Scholar Renewal Committees use internal referees and a minimum of three external referees. The Major Equipment and Technology Transfer Committees use internal referees and may use external referees.The remaining review committees use internal referees alone.

A measure of the quality of the decisions made by the Application Advisory Committees can be gained from the following information.

First, the selectivity of the Advisory Committees can be assessed from Table 3 which shows the success rate of applications for awards for Full-time Studentships, Full-time Fellowships, Clinical Investigatorships, Scholarships and Scientists for five competitions during 1984-86.

TABLE 3
Application Success Rate

PROGRAM	Number of Awards	Number of Applications	Percentage Approved
Full-Time Studentships	219	443	49
Full-Time Fellowships	244	465	52
Clinical Investigatorships	10	15	67
Scholarships	51	94	54
Scholarships (Renewal)	17	22	77
Scientists	5	6	8

Second, as mentioned previously, over half of the 109 Scientists, Scholars and Clinical Investigators have come from outside of Alberta (24 from the U.S., 16 from other countries and 16 from other universities in Canada). Further, all 8 of the Scientists and 70 of the 75 Scholars who have completed the period (2-3 years) on an Establishment Grant have obtained operating support from Canadian national research agencies with high quality peer review systems. As stated before, this is a much more impressive record than that of other first applicants to these agencies, only 30 per cent of whom are awarded operating grants.

Third, the subsequent record of those who have completed full-time Studentships and Fellowships can be considered as more than satisfactory. Of the 172 Students who have completed their programs (113 Ph.D., 59 M.Sc.), 110 have pursued postdoctoral training, 16 have entered an M.D. program and 16 a Ph.D. program. Of the 250 Fellows who have completed their postdoctoral training as Heritage Fellows, 71 are in academic research positions, 92 are employed in a professional/technical capacity, and 51 are taking additional postdoctoral research or clinical fellowship training — a total of 214.

THE IMPACT OF THE AHFMR PROGRAMS ON RESEARCH, EDUCATION AND PATIENT CARE

The impact of the Foundation will be discussed largely in relation to the following programs: Scientists, Scholarships, Establishment Grants, Full-time Studentships, Full-time Fellowships, Major Equipment, and Research Support programs such as those for Faculty Travel, Visiting Professorships and Scientists, Conferences and Workshops. For a number of the remaining programs their lives to this point have been too short (e.g., Clinical Investigators, Clinical Fellows and Clinical Trainees) for their impact to be assessed. While the Heritage Medical Research Buildings are not yet in operation it is clear that without them the development of new multidisciplinary research groups would be difficult if not impossible. It is imperative that such groups be established if Alberta is to be at the forefront of modern medical research.

I Impact in Alberta

There is no doubt whatsoever that the Foundation has had a *profound* effect on medical research and education (particularly at the graduate and postdoctoral levels) and a beginning and expanding influence on patient care in the Province of Alberta. Furthermore it is clear that international recognition of The Universities of Alberta and Calgary has been greatly enhanced as a result of the AHFMR programs.

1. Impact on the Faculties of Medicine of The Universities of Alberta and Calgary

(a) Research

As indicated previously (Table 1) during the period 1980-86 11 Scientists, 81 Scholars and 6 Clinical Investigators have been appointed to the two Faculties of Medicine, a number comprising 20% of the Full-time equivalent faculty. Over one-half of these Scientists, Scholars and Clinical Investigators have been attracted from outside of Alberta — from other parts of Canada, from the U.S., and from other countries. Scholars and Scientists considered this attraction to be based on a unique mix of the following factors: the opportunity to collaborate with first-class scientists in many disciplines, the preservation of research time, the availability of Establishment Grants and the ability of the research training programs to attract high calibre graduate and postdoctoral students. In addition a number of Clinical Investigators emphasized the sensitivity of the Foundation to their time problems.

During the same period some 272 Full-time Studentships and 318 Full-time Fellowships have been awarded in the two Faculties of Medicine. This has occurred at a time when other sources of funds for research training, both provincial and national, have remained unchanged. Of the 272 Students, 193 or 70% took their previous training outside of Alberta (110 other Canadian universities; 23 U.S.; 30 U.K. and Ireland; 10 Europe; 12 Japan, India and Southeast Asia; and 8 other countries). Of the 318 Fellows, 269 or 84% took their prior doctoral training outside of Alberta (54 other Canadian universities; 40 U.S.; 56 U.K. and Ireland; 43 Europe; 50 Japan, India and Southeast Asia; and 26 other countries). Those Students and Fellows whom the IBR interviewed indicated that the attraction to Alberta had been based on the high calibre of the research supervisors, the quality and variety of Visiting Professors and Scientists, and the generous terms of the traineeships (including an allowance for travel to scientific meetings). At the Fellowship level the possibility of having support for four of six years makes it especially attractive for those who wish to change the direction of their work or even to change fields completely.

The evidence for the superior quality of these new investigators and students has been discussed above under "The Peer Review System".

All of those in the two Faculties of Medicine whom we interviewed — from students to deans — attested to the remarkable milieu for medical research and research training which had developed as a result of the recruitment of an unusual mix of talented investigators and students and the support of research through Establishment Grants and Grants for Faculty Travel, Visiting Professors and Scientists, Conferences and Workshops.

(b) Education

The impact on graduate and postdoctoral

education in medical research has just been described under "Research".

It is too early to assess the impact of the Heritage programs on medical undergraduate and residency education. Nonetheless there are very promising influences. The availability of Summer Studentships and Part-time Studentships for those in undergraduate health professional programs permits exposure of students to first class investigators at an early stage. The provision of Part-time Fellowships for those with a Ph.D. degree who are undergraduates in health science programs is another major attraction since it enables students to continue to consolidate their interest in medical research while completing the M.D. or other health professional degree.This may explain why the proportion of medical students with Ph.D.s at The University of Calgary is twice the national average.

Further time must pass before one can assess the impact of increased exposure of residents to Heritage Scientists, Scholars and Clinical Investigators on the quality of those applying for residency training and the interest of residents in medical research as a career.

(c) Patient Care

Heritage Scientists, Scholars and Clinical Investigators in the two Faculties of Medicine have influenced patient care in one or more of the following ways. Firstly, a number of these researchers are expert clinicians in areas which previously have not been covered well in Alberta(Category 1). Secondly, the research of a number of these investigators is already having an impact on the prevention, diagnosis or treatment of disease (Category 2).And thirdly, because of their technical expertise a number of non-clinical researchers have become indispensable members of clinical teams (Category 3).

The following are examples in Category 1:

Cardiac arrhythmias
F. Witkowski (Alberta), and,
H. Duff and G. Wyse with the support of basic scientists W. Giles, H. ter Keurs, and J. Tyberg (Calgary)

Alzheimer's disease
I. Parhad and R. Auer (Calgary)

Nutritional needs of newborn infants
J. Van Aerde (Alberta)

Sleep disturbances
J. Remmers (Calgary)

Pediatric infectious disease
W. Wenman (Alberta)

Liver disease (particularly hepatitis and cirrhosis)
G. Minuk (Calgary)

Viral infections
J. Preiksaitis (Alberta)

Arthritis
M. Fritzler with the support of basic scientists R. McGarry and D. Hart (Calgary)

Autism in childhood
C. Lord (Alberta)

The following are examples in Category 2:

Diagnosis of parasitic infections
D. Befus (Calgary)

The prevention of type 1 diabetes mellitus by cyclosporin
M. Jaworski (Alberta)

Molecular diagnosis of genetic disease
D. Hoar, D. Matheson and F. Snyder (Calgary)

Islet cell transplantation as a treatment for type I diabetes mellitus
G. Warnock (Alberta)

Diagnosis of viral infections
M. Gill, R. Anderson and P. Sokol (Calgary)

Antibody therapy for small cell carcinoma of the lung
G. MacLean (Alberta)

The early diagnosis of postmenopausal osteoporosis by bone densitometry
T. Hangartner (Alberta).

The following are examples in Category 3:

The in vitro fertilization and artificial insemination clinical programs
D. Mortimer (Calgary)

The diagnosis of disease by nuclear magnetic resonance imaging
P. Allen (Alberta)

High risk pregnancy program
J. Maloney (Calgary)

2. Impact on Other Faculties of The Universities of Alberta and Calgary

The Foundation's impact on other Faculties has been principally through the Research Support programs, Scholarships, Full-time Studentships and Fellowships and Establishment Grants.

Impact . . . . continued

Eleven of the 92 Heritage Scholars are from Faculties other than Medicine (Science 7; Pharmacy 1; Home Economics 1; Social Sciences 1; Agriculture/Forestry 1; and none in Dentistry or Nursing). All 11 Scholars obtained Establishment Grants. In addition non-medical Faculties have received 13 Independent Establishment Grants (Science 7; Dentistry 4; Physical Education and Social Sciences 1 each).

During the 1980-86 period, 192 of the 464 Full-time Studentship awards in Alberta were to candidates in Faculties other than Medicine (Science 131; Pharmacy 40; Engineering 8; Physical Education 5; Social Sciences 4; Nursing 2; Dentistry and Home Economics 1 each).

During the same period, 107 of the 425 Full-time Fellowship awards in The Universities of Alberta and Calgary have been to students in Faculties other than Medicine (Science 71; Pharmacy 21; Dentistry, Social Sciences and Home Economics 4 each; Agriculture/Forestry 2; Engineering 1).

From the written and verbal comments of the Deans of the non-medical Faculties it is clear that AHFMR funding has been very important for the development of new research as well as for the growth of existing projects. Furthermore Foundation support has made Faculties (principally Science and Pharmacy) more competitive and successful in national competitions.

II Impact Outside of Alberta

AHFMR Programs have had or will have an influence outside of Alberta in the following ways.

During 1980 - 86, 326 Full-time Studentships and 357 Full-time Fellowships awarded for study in Alberta have been given to students whose previous training was taken outside of Alberta.

During the same period there were 9 Studentships and 75 Fellowships held by Alberta students outside of the province.

And finally it is obvious that research supported by the Foundation will have an increasing impact outside Alberta.

I Maintenance of Vigour, Innovation and Excellence in a Steady State

The programs of the Heritage Foundation are still in their growth phase. New Medical Scholars, Scientists and Clinical Investigators are being added to the faculties of The Universities of Alberta and Calgary each year. New Heritage Students and Fellows are being recruited annually. It is already apparent that these programs are having, and will continue to have, a major impact on the range and quality of biomedical research in Alberta. It is also apparent that this phase of almost exponential growth can, at the most, continue only for another four or five years. It is important, therefore, that considerable thought be given to the future of the AHFMR programs once they reach their "steady state". The various educational programs should present no problem. The numbers of Studentships, Fellowships, and Clinical Traineeships can be set at levels that are considered appropriate, and reasonable predictions can be made about the future costs of these programs even in the face of inflation. The only serious concerns about these programs come from: (1) the conviction that the numbers of people trained should not exceed the size of the pool of really talented young people so that the quality of the trainees remains competitively high; and (2) the likelihood that employment opportunities for biomedical scientists will not expand significantly over the next fifteen to twenty years, and in most academic institutions may well contract. Since by their nature traineeships are of limited tenure the steady state situation can be predicted with little difficulty.

However, the situation is quite different in the Scholar and Scientist programs. These have grown rather rapidly. In the six years since the programs were initiated over 100 Scholars and Scientists have been appointed. Unless there is some degree of turnover or attrition, it is clear that by the year 1991, or shortly thereafter, the programs will have reached their projected size of some 200 Scholars and Scientists. If this is to be the steady state size of the programs it is not too soon to consider how to ensure that only

the most productive and effective investigators are supported by the AHFMR and how the programs can be continually renewed by the addition of new, young investigators. Unless they are continually infused with new blood, the strength of the programs is bound to be attenuated with time. To achieve this the programs must be structured in such a way that at each level only the most productive investigators continue to be supported, and at the same time those recruited into the program as Scholars or Scientists should understand from the beginning that continued research support from AHFMR is critically dependent on their sustained scientific productivity.

By its nature the structure will be pyramidal: there will always be appreciably more Scholars in their initial five years of support than Scholars in their second five years; and the number of Scholars in their second five years will always exceed the number of Scientists. To maintain this structure it will be necessary to set up an effective system for the review of all Scholars, and it should be generally understood that only a proportion of the Scholars will be reappointed for a further five years and that only those Scholars who, after the most careful review, are appointed as Scientists will continue to be supported by the AHFMR beyond their initial ten year period.

We cannot emphasize too strongly the importance of the review of Scholars after the initial five years. This review should be both critical and fair, and although it would be unwise to set rigid quotas for the numbers who are likely to receive continued support, the approximate numbers that will allow for continued self renewal should be determined in advance. The primary, if not the sole criterion for support should be the excellence of the scientific work carried out in the previous five years and the quality of the research proposal submitted for the ensuing five years. Although the scientific evaluation is mainly intended to serve the purposes of the AHFMR, the Universities which have a strong interest in the matter will naturally wish to be consulted and to have some input into the review process. It is important, however, that the decision whether or not to continue the support of an AHFMR Scholar should be quite independent of the University's decision to grant the individual tenure. Tenure decisions within the Universities must take into consideration several factors that are either unrelated to, or only partly related to, the Scholar's research.

Since it is likely that most Scholars who are in their second five year period of support already have been given tenure by their University, the question of whether or not they are to be promoted to the rank of Scientist within the AHFMR should be based solely on their research accomplishments. If the initial appointment as a Scholar is based primarily on promise, continuation as a Scientist must be based on demonstrable accomplishment.

It is our expectation that only a proportion of the Scholars in their second five year period will be judged to be of sufficient distinction to warrant promotion to the rank of Scientist. Moreover, we believe it is important that not all appointments to the rank of Scientist should be from within the program. It will be greatly to the advantage of both Universities if, with the help of the AHFMR, they can recruit a small number of truly outstanding senior scientists in areas that might not otherwise be represented in the research of either medical school.

We anticipate that the distinction of the Medical Scientist will be such that they will be much sought after by other institutions in Canada or elsewhere. This by itself will provide for some degree of turnover at the senior level; but to ensure that only work of the highest calibre continues to be supported, we recommend that the programs of all Medical Scientists be reviewed at intervals of no more than five years. It need hardly be emphasized that such senior investigators should be treated humanely and fairly. At the same time we believe that the continued success of the entire program is crucially dependent on the sustained excellence of the senior scientists, and that they be judged as rigorously and as critically as their younger colleagues. Appointment as a Medical Scientist should be seen as a mark of scientific distinction, and the assurance of continued support should only be for as long as the investigator's work warrants it. It should not be viewed as a career-long guarantee of maintained funding regardless of productivity or excellence.

The IBR recognizes that the decision not to continue the support of a senior investigator has important implications for the two Universities. In view of this we strongly urge that the Universities consider this issue in their long range planning, and that the matter be the subject of continued discussions between the Universities and the AHFMR.

RECOMMENDATION 1

THAT the Scholar and Medical Scientist programs be structured in such a way as to permit continued self renewal. It is suggested that there be very careful and rigorous review of Scholars after the initial five year appointment and that it be generally understood that not all Scholars will be reappointed for a further five year period. Similarly, only a proportion of those who are continued for a further five years will be promoted to the rank of Medical Scientist. It is further suggested that:

1) both Universities should, on occasion, appoint Medical Scientists from outside the Foundation's programs to bring to Alberta scientists of unusual distinction or scientists whose work is in important areas that are not otherwise well represented in the two Universities;

2) the continuation of the Scientist's appointment be assured only as long as productivity and excellence are maintained.

In the interests of fairness it is imperative that it be made clear to prospective Scholars and Scientists what is expected of them from the beginning, and how and on what basis their progress will be reviewed.

Since these recommendations are likely to have important implications for both Universities, we further recommend that both Universities consider what alternative opportunities can be developed for Scholars and Scientists who are no longer supported by the AHFMR.

II Programs

1. The Recruitment of Scholars and Scientists

We believe that the current procedures for the approval and appointment of Heritage Scholars and Scientists are less than optimal in facilitating the recruitment of the most desirable candidates to these positions. It is probable that the strongest candidates will have other opportunities against which the Alberta institutions must compete. In most of these instances the person responsible for the recruitment will be able to make a firm offer that can be agreed upon directly. In the case of the Heritage Scholar or Scientist position however, the roles are immediately reversed and rather than being a sought after candidate, the individual being recruited is now made an applicant. He must submit a research plan that will be reviewed by committees advisory to the Scientific Advisory Council or by SAC itself. And the latter may meet only twice a year. Not only does this involve what may be a rather long delay between tentative offer and final approval, during which the candidate may elect to accept another more direct offer of an assured appointment, but in the case of really senior scientists the procedure may often seem inappropriate to their stature. It is not surprising, therefore, that we were told of a number of recruitments that had failed for this reason.

We believe that more expeditious procedures should be devised that would make it possible for the responsible recruiting officer to make a firm offer, not contingent on approval of a proposal submitted by the candidate, when the credentials of the candidate have been sufficiently established through previous review and solicitations of recommendations from appropriate experts.

Several possible mechanisms might be put in place. For example, the record of the candidate for a Scholar appointment might be presented to a review committee, along with recommendations from outside referees, for approval of the candidate without the submission of a formal research proposal. Members of the review panel could also have arranged to attend a seminar presented by the candidate. Thus the quality of the potential Scholar could be evaluated and provide the basis for appointment rather than his proposed research project. Perhaps in such instances the Establishment Grant might be withheld until later approval of a proposal submitted by the

now appointed investigator. In this way, the initial commitment of the Foundation would be limited to the salary of the Scholar for five years.

In the case of Heritage Scientists we believe that the candidates will, or should be, individuals with strong records of previous scientific achievement and international reputations in their fields of research. The Scientific Advisory Council could readily approve in advance offers to such individuals. However, it would be necessary, for efficient operation of this procedure, to meet far more frequently or establish a subcommittee that would be prepared to do so.

RECOMMENDATION 2

THAT a mechanism be devised to shorten and facilitate the procedure for recruitment of highly desirable Scholars and Scientists. It is suggested that the Scientific Advisory Council, a subcommittee of this body, or a special advisory committee could, on the basis of certain evidence, give approval for salary support. The Establishment Grant could be withheld until a research proposal was submitted by the candidate and approved.

2. Multidisciplinary Research Groups and the Heritage Medical Research Buildings

(a) The Orientation of the Research Groups

The University of Calgary and The University of Alberta are in the process of developing research proposals for "major multidisciplinary medical research thrusts": (quotation from Dr. McLeod's letter of 84/02/22 to Dr. Wagner) that will provide the basis for organizing research groups to occupy the new research buildings under construction on the respective campuses. In designing their proposals both institutions are responding to the direction provided by the President and the Scientific Advisory Council that these proposals should be "built upon existing or readily developable areas of basic strength and emphasize clinical research". The International Board of Review has been informed of the progress that both institutions have made in the development of these groups and has discussed at some length the interpretation of the mandate that has been made by the respective institutions. We wish to comment on these aspects as well as on the mandate itself.

Let it be said once again that the IBR strongly supports the development of new multidisciplinary research groups and of the Heritage Medical Research Buildings which are needed to house them.

The precise meanings of "basic research" and "clinical research" are, of course, debatable, and the terms mean different things to different people. Nonetheless, these terms are used and in a general sense they may convey opposing views on fundamental vs. applied medical research. The IBR hopes that the two Universities will develop, and that SAC will approve, the formation of research groups that in most instances will lean toward fundamental research and that investigators will be sought who are at the "cutting edge" of their fields. Undue emphasis on immediate clinical relevance may lead to the formation of relatively ineffective or even mediocre research groups. In stressing the importance of the Foundation's support of basic research, the IBR in no way wishes to play down the importance of clinicians who are trained to conduct basic research. Nor does it wish to discount the importance of elucidating the mechanisms of the disturbances in human diseases and of performing clinical trials on the effectiveness of preventive, diagnostic and therapeutic measures. We only wish to emphasize that these activities may best be performed in a setting in which the principal thrust is at a very fundamental level.

RECOMMENDATION 3

THAT while it is accepted that members of a multidisciplinary group will often cover the spectrum from "bench to bedside", the orientation of the group should lean toward fundamental research and the investigators should be at the "cutting edge" of their fields.

(b) The Participation of the Non-Medical Faculties In Groups in the Heritage Buildings

At The Universities of Alberta and Calgary the mechanism for deciding which research groups

will be proposed for consideration by the SAC for space in the Heritage Buildings involves a committee chaired by the Dean of the Faculty of Medicine. The IBR was led to believe by some non-medical Faculty Deans that the opportunity for their Faculty members to participate in multidisciplinary groups was limited. In the Faculties of Science at both Universities there are strengths in areas related to Medicine, e.g. Genetics at Alberta and Biochemistry at Calgary. The Faculty of Pharmacy at The University of Alberta can make important contributions in such areas as the synthesis and metabolism of drugs and clinical pharmacy. In the non-medical Faculties there have been 11 Scholars, all with Establishment Grants (Science 7; Pharmacy 1; Home Economics, Social Sciences and Agriculture/Forestry 1 each) and 13 Independent Establishment Grants (Science 7; Dentistry 4; Physical Education and Social Sciences 1 each). While it can be argued that these strengths should be considered when plans for research groups in the new buildings are being made it may be more practical to support the Faculties of Science, at least, through other programs outside of the Heritage buildings in instances where geographical considerations are important.

RECOMMENDATION 4

THAT the Foundation review with the two Universities the mechanism for developing research groups for the Heritage Buildings with a view to determining whether the non-medical Faculties have sufficient input.

3. The Involvement of the Non-Medical Health Professional Faculties in Foundation Programs

The Faculties of Pharmacy, Dentistry and Home Economics at The University of Alberta, the Faculty of Social Sciences at The University of Calgary and the Faculties of Nursing and Physical Education at both Universities have all benefited from the Foundation's Research Support Programs, Establishment Grants and Training Programs. However, there have been no Heritage Scientist appointments in these Faculties and only one Scholar has been appointed in each of the Faculties of Pharmacy, Home Economics and Social Sciences. There have been no Heritage Scholars in the Faculties of Dentistry, Nursing or Physical Education.

At present holders of the Pharm. D. degree are not eligible for the Heritage Scholar and Scientist competitions. However it is increasingly recognized that most programs leading to the Pharm. D. degree in the U.S. provide training of comparable calibre to that of the M.D., D.D.S. and D.V.M. programs.

RECOMMENDATION 5

i. THAT the Foundation explore ways to make it possible for the non-medical health professional Faculties to recruit faculty who would be competitive in the Scientist and Scholar competitions.
ii THAT consideration be given to making holders of the Pharm. D. degree eligible for the Scholar and Scientist Programs.

4. Operating Grants

At present the only operating grants for which the Foundation will accept applications are those concerned with the Technology Transfer Program and with pilot projects for clinical trials. Following discussion with scientists and administrators at both Universities the IBR sees no need to change this policy.

5. Patient-Based Research in Hospitals

Dr. C. A. Guenther, Vice-President Clinical Development and Research, Foothills Hospital and former Chairman, Department of Medicine, University of Calgary discussed with the IBR the increase in patient-based research in the University Hospitals which will occur as the research groups develop in the Heritage Buildings. He felt strongly that the hospitals could not bear the costs of this research alone.

RECOMMENDATION 6

THAT the Foundation explore with the principal University Affiliated Teaching Hospitals and the Government of the Province of Alberta mechanisms for sharing the support of patient-based research in University Hospitals.

6. Research on the Care of the Patient

Professor J. D. Calkin, Dean of the Faculty of Nursing, University of Calgary spoke to the IBR about the need to support studies in the area of the care of the patient (as distinct from the care of the disease which the patient bears). An example of such a study is the investigation of certain qualities (e.g. compassion) and approaches of health professionals on the ability of patients to adopt preventive and treatment measures, their ability to cope with an illness, and even their ability to recover from an illness.

The care of the patient is an important area for study in view of the steady increase in emphasis on the high technology aspects of diagnosis and treatment. The development of specific quantitative techniques for study of the care of the patient is an urgent need.The Foundation should consider encouraging research in this area but only if it is of the highest quality and multidisciplinary in nature.

7. Summer Studentships, Full-Time Studentships and Full-Time Fellowships: Number per Supervisor

The booklet "AHFMR Guidelines for Grants and Awards" states that a limit of two Summer Studentship applications may be sponsored by a faculty supervisor and that a supervisor should not normally have responsibility for more than four full-time graduate students or more than four full-time postdoctoral fellows. The IBR believes that there is ample evidence from many other institutions that strong faculty members can provide excellent supervision for more than the stated number of trainees. Hence the following recommendation is made.

RECOMMENDATION 7

THAT the restriction on the numbers of Summer Studentships and Full-Time Studentships and Fellowships per supervisor be removed.

III The Peer Review System

1. Communication to Applicants

The IBR had much discussion with investigators in general and Scholars in particular, as well as with the President, concerning feedback to applicants about their progress and the review of their applications.

It should first be noted that Recommendation 1 above has addressed the need to make more clear to prospective Scholars and Scientists what is expected of them and how and on what basis their progress will be reviewed.

The following is a description of a number of the present feedback mechanisms as reported by the President.

(a) Publication of the Membership of Review Committees

The membership of the Scientific Advisory Council which reviews the applications for Scientists and for Multidisciplinary Research Groups is well known.The question of making the membership of other review committees known to the scientific community has been discussed annually and rejected by the majority of Albertans who serve on these committees. It has been felt that the Alberta medical research community is too small and that those who have announced that they are members of review committees have been placed under undue pressure.

(b) Review of Annual Reports of Scholars

It is the custom of The Universities of Alberta and Calgary for Departmental Heads and Chairmen to carry out annual career reviews with all members of their departments. The President reviews the annual research reports prepared for the Foundation by each Scholar. If from such reports he has concerns about the research progress of a Scholar he discusses these concerns with the appropriate departmental Head or Chairman. The latter is then free to raise these concerns with the Scholar at the time of the annual review or at any other time.

(c) Transmission of Referee Reports to Applicants

It is the present custom to transmit a summary of the referee reports (anonymously) to all applicants for Scientist, Scholar and Clinical

Investigator awards. For all other applications a summary of the reports is provided to failed applicants but only on request.

(d) The Scholarship Renewal Procedure

The details of the application process and the review procedure have been published. The basis of the conclusions of the Scholarship Renewal Committee along with the referee reports have been transmitted in summary form to the Scholars. Those Scholars whose application for renewal has been turned down have been invited to request reconsideration of the decision within a specified time period.

The IBR supports the above procedures. It strongly recommends that they be made as widely known and understood as possible.

2. Members from Non-Medical Faculties on Peer Review Committees

Of the 44 current Alberta members of peer review committees 1 to 8 (Table 2), 41 are investigators from the two Faculties of Medicine and three are investigators from other Faculties (Science 1; Pharmacy 1; Dentistry 1).

RECOMMENDATION 8

THAT the number of members from non-medical Faculties at The Universities of Alberta and Calgary be increased on peer review committees.

3. Members from Outside of Alberta on Peer Review Committees

Currently, eight of the 12 members of the Scientific Advisory Council are from outside Alberta. Of the 50 members of the remaining eight peer review committees four members are from outside Alberta.

RECOMMENDATION 9

THAT the number of members from outside Alberta be increased on all peer review committees except the Scientific Advisory Council.

IV Administration

1. Board of Trustees

As presently constituted the terms of office and procedure for the appointment of members of the Board of Trustees will result in the whole of the membership being replaced over a period of two years. To obviate this, the following recommendation is made.

RECOMMENDATION 10

THAT the Board of Trustees develop a mechanism which will ensure an orderly succession and appropriate continuity.

2. Scientific Advisory Council

A description of the Terms of Reference and Duties of the SAC and the Method of Selection of its members, prepared by the President, is in Appendix 2.

The composition of the present Council, its role as a peer review committee and its potential role in the speeding up of the process of recruiting Scholars and Scientists have been described in the text.

The IBR understands the Foundation's policy to be that the members of the SAC hold office for an initial period of three years. The policy further dictates that succeeding appointments are for one, two or three years so that approximately one-third of the members retire each year. No trustee, officer or employee other than the President is eligible for appointment as a member of Council. The President serves as Chairman of Council. At each meeting of Council, two to three Trustees attend and participate in the meeting facilitating communication between the two bodies.

The SAC has held approximately two meetings per year over the past three years. From 1980 to 1983, at a time when considerable planning took place, meetings occurred more frequently. It is clear that the assessment of applications for multidisciplinary research groups, and the monitoring of those groups which have been approved, will require increased activity of the SAC and/or of those to whom it may delegate some of these

responsibilities. Even greater activity would be required if, as recommended by a number of investigators, the SAC were to become more involved in developing new initiatives.

A discussion of these matters has led the IBR to the following recommendations.

RECOMMENDATION 11

i THAT the breadth of coverage, overall structure, and mix of national and international membership of the Scientific Advisory Council be retained.
ii THAT some modification of rules relating to the rotation of members of Council be considered to ensure the enlistment and retention of effective members. One proposal is that non-Albertans be given an initial two year appointment with a second or even a third two year term offered to effective members.
iii THAT consideration be given to Council playing an even greater role in developing new initiatives. This responsibility along with that of assessing and monitoring multidisciplinary research groups would necessitate longer and/or more frequent meetings of Council.

V Finance

The IBR strongly supports the Foundation's plans for a steady state group of approximately 200 Scholars, Scientists and Clinical Investigators with the ancillary training and research support programs which have been described above. At the beginning it was estimated that this enterprise could be maintained on the initial Endowment of $300 million along with retained unexpended interest accumulated during the initial years and increased by the high earning rates of the early nineteen eighties. While in the early years the value of the Endowment increased to over $400 million, unexpected changes in interest rates and the need to provide funds for the Heritage Medical Research Buildings have sharply reduced the rate of growth of the Foundation's Endowment and have raised questions as to whether or not it would be possible to maintain the Foundation's research and training programs at their initially projected levels. Based on our conviction that these programs, in their steady state, should support about 200 Scholars, Scientists and Clinical Investigators, we strongly recommend that every effort be made to increase the Endowment of the AHFMR to the appropriate level as soon as possible. Without such an increase, the rate of growth of the programs will be appreciably slowed, and the ultimate size of the entire enterprise will have to be scaled down. Given the remarkable impact that the AHFMR has already had on both basic and clinical research in the Province of Alberta, to slow its development and scale down the scope would be most unfortunate.

RECOMMENDATION 12

THAT consideration be given to increasing the Endowment of the AHFMR to ensure that its programs of research and training can be effectively maintained at the level that was initially determined to be optimal.

VI Relationship of the AHFMR with the Provincial Government

From the beginning the relationship of the AHFMR with the Provincial Government has been independent, or at "arm's length", such that the Foundation has not been subject to annual financial appropriations. Moreover, the Government has not interfered with the functions of the Foundation nor has it imposed initiatives upon it. We perceive that a great deal of the success of the AHFMR stems from this arm's length relationship.

RECOMMENDATION 13

THAT the current independent relationship between the Foundation and the Provincial Government be preserved.

The IBR wishes to stress the vital role which the President of the Foundation can play. The Foundation has been very fortunate in its first President. Dr. McLeod's leadership, knowledge of what is first-rate, his deft diplomacy and understanding of people have been outstanding. This view has been echoed from all quarters during our site visits.

SUMMARY OF RECOMMENDATIONS

RECOMMENDATION 1

THAT the Scholar and Medical Scientist programs be structured in such a way as to permit continued self renewal. It is suggested that there be very careful and rigorous review of Scholars after the initial five year appointment and that it be generally understood that not all Scholars will be reappointed for a further five year period. Similarly, only a proportion of those who are continued for a further five years will be promoted to the rank of Medical Scientist. It is further suggested that:

1) both Universities should, on occasion, appoint Medical Scientists from outside the Foundation's programs to bring to Alberta scientists of unusual distinction or scientists whose work is in important areas that are not otherwise well represented in the two Universities;

2) the continuation of the Scientist's appointment be assured only as long as productivity and excellence are maintained.

In the interests of fairness it is imperative that it be made clear to prospective Scholars and Scientists what is expected of them from the beginning, and how and on what basis their progress will be reviewed.

Since these recommendations are likely to have important implications for both Universities, we further recommend that both Universities consider what alternative opportunities can be developed for Scholars and Scientists who are no longer supported by the AHFMR.

RECOMMENDATION 2

THAT a mechanism be devised to shorten and facilitate the procedure for recruitment of highly desirable Scholars and Scientists. It is suggested that the Scientific Advisory Council, a subcommittee of this body, or a special advisory committee could, on the basis of certain evidence, give approval for salary support. The Establishment Grant could be withheld until a research proposal was submitted by the candidate and approved.

RECOMMENDATION 3

THAT while it is accepted that members of a multidisciplinary group will often cover the spectrum from "bench to bedside", the orientation of the group should lean toward fundamental research and the investigators should be at the "cutting edge" of their fields.

RECOMMENDATION 4

THAT the Foundation review with the two Universities the mechanism for developing research groups for the Heritage Buildings with a view to determining whether the non-medical Faculties have sufficient input.

RECOMMENDATION 5

i. THAT the Foundation explore ways to make it possible for the non-medical health professional Faculties to recruit faculty who would be competitive in the Scientist and Scholar competitions.

ii THAT consideration be given to making holders of the Pharm. D. degree eligible for the Scholar and Scientist Programs.

RECOMMENDATION 6

THAT the Foundation explore with the principal University Affiliated Teaching Hospitals and the Government of the Province of Alberta mechanisms for sharing the support of patient-based research in University Hospitals.

RECOMMENDATION 7

THAT the restriction on the numbers of Summer Studentships and Full-Time Studentships and Fellowships per supervisor be removed.

RECOMMENDATION 8

THAT the number of members from non-medical Faculties at The Universities of Alberta and Calgary be increased on peer review committees.

APPENDIX 1A

RECOMMENDATION 9

THAT the number of members from outside Alberta be increased on all peer review committees except the Scientific Advisory Council.

RECOMMENDATION 10

THAT the Board of Trustees develop a mechanism which will ensure an orderly succession and appropriate continuity.

RECOMMENDATION 11

i THAT the breadth of coverage, overall structure, and mix of national and international membership of the Scientific Advisory Council be retained.
ii THAT some modification of rules relating to the rotation of members of Council be considered to ensure the enlistment and retention of effective members. One proposal is that non-Albertans be given an initial two year appointment with a second or even a third two year term offered to effective members.
iii THAT consideration be given to Council playing an even greater role in developing new initiatives. This responsibility along with that of assessing and monitoring multidisciplinary research groups would necessitate longer and/or more frequent meetings of Council.

RECOMMENDATION 12

THAT consideration be given to increasing the Endowment of the AHFMR to ensure that its programs of research and training can be effectively maintained at the level that was initially determined to be optimal.

RECOMMENDATION 13

THAT the current independent relationship between the Foundation and the Provincial Government be preserved.

Itinerary — University of Alberta Site Visit

TUESDAY, MAY 20

9:00 a.m. - 5:00 p.m.
Meeting with Drs. L. E. McLeod, J. Colter, D. L. Tyrrell and staff of AHFMR, 3125 Manulife Place, Edmonton.

WEDNESDAY, MAY 21

8:00 - 9:30 a.m.
Breakfast meeting at University House with Vice President (Research) Gordin Kaplan and Faculty Deans: R.G. Glassford (Physical Education), J. McPhail (Nursing), G.W. Thompson (Dentistry), D. Badir (Home Economics), L.I. Wiebe (Pharmacy), W.J. McDonald (Science), M.C. Piper (Rehabilitation Medicine), and D.R. Wilson (Medicine).

9:30 - 10:30 a.m.
Associate Dean, and two members of the Teaching Staff, Faculty of Pharmacy.

10:30 - 11:30 a.m.
Dean, Faculty of Dentistry.

11:30 - 12:00 noon
Dean, Faculty of Science, Chairmen of Departments of Chemistry and Zoology.

12:00 - 12:30 p.m.
Description of University of Alberta Heritage Medical Research Building by Mr. Tim Miner, Director of Planning and Development.

12:30 - 1:30 p.m.
Lunch with group of Heritage Medical Scientists, Scholars and Clinical Investigators.

2:00 - 5:00 p.m.
Faculty of Medicine Mini Symposium, Dean's Conference Room, University of Alberta Health Sciences Centre: Drs. M. Jaworski, J. Beauchene, D. Green, G. MacLean, M. Paterson, R. Rajotte, G. Warnock, W. Schneider, F. Witkowski.

APPENDIX 1B

THURSDAY, MAY 22

8:30 - 9:30 a.m.
Dr. Peter Allen — Clinical NMR Unit.

9:30 - 10:30 a.m.
Drs. M. James and W. Anderson — X-Ray Diffraction Analysis.

10:30 - 11:30 a.m.
Meeting with Drs. J. Wiener (Professor of Biochemistry), A. Salmi (Heritage Scientist, Microbiology), G. McFadden (Heritage Scholar, Biochemistry) and R. Reithmeier (Heritage Scholar, Biochemistry).

11:30 - 12:30 p.m.
Meeting with Dr. R. Stein (Professor of Physiology) and four Heritage Scholars: Drs. P. Smith (Pharmacology), F. Witkowski (Medicine), D. Green (Immunology), and B. Singh (Immunology).

12:30 - 1:30 p.m.
Lunch with Heritage Students and Fellows

1:30 - 3:00 p.m.
Dr. D. R. Wilson, Dean of Medicine and Associate Dean (Research) M. Poznansky.

3:00 - 4:00 p.m.
Meeting with Senior Faculty members: Drs. E. McCoy (Professor of Paediatrics), D.L. Tyrrell (Chairman, Department of Microbiology and Infectious Disease), J. Colter (Chairman, Department of Biochemistry), D. Cook (Chairman, Department of Pharmacology) and H.T.G. Williams (Chairman, Department of Surgery).

Itinerary — University of Calgary Site Visit

WEDNESDAY, JULY 9

8:00 - 9:30 a.m.
Dr. L.E. McLeod, Board of Governors' Conference Room, University of Calgary.

9:30 - 10:00 a.m.
Dr. Wagner, President of The University of Calgary.

10:00 - 11:00 a.m.
Dr. D. Armstrong, Dean of the Faculty of Science.

11:00 - 11:30 a.m.
Dean R. Jackson and Professor B. Nigg, Faculty of Physical Education.

11:30 - 12:00 noon
Dr. J. D. Calkin, Dean of the Faculty of Nursing.

12:30 - 1:30 p.m.
Lunch with three Scholars (Drs. M.J. Fritzler, J.A. Hoffer and R.H. Martin), one Clinical Investigator (R.A. Scott) and one Medical Scientist (Dr. J. Wang), University of Calgary Health Sciences Centre.

1:30 - 2:00 p.m.
Dr. M. Watanabe, Dean of Medicine, and Dr. Robert Church, Associate Dean of Research.

2:00 - 4:00 p.m.
Development of Cardiovascular Research in the Medical School at the University of Calgary: Bench to Bedside.

2:00 - Dr. Henk ter Keurs (Scientist): Introduction.

2:05 - Dr. Wayne Giles (Scholar): Electrical Properties of Cardiac Cells.

2:15 - Dr. Wayne Giles and Dr. Henry Duff (Scholars): Drugs and Electrical Properties of the Heart.

2:25 - Dr. Wayne Giles and Dr. Brent Mitchell,

Clinical Studies:Drug Treatment of Patients with Cardiac Arrhythmias.

2:30 - Discussion.

2:40 - Dr. Henk ter Keurs (Scientist): Mechanical Properties of the Cardiac Cell.

2:50 - Dr. John Tyberg (Scientist): Cardiac Pump Function:The Role of the Pericardial Constraint.

3:00 - Dr. Eldon Smith (Chairman, Dept. of Medicine):Clinical Assessment of Cardiac Function:The Role of the Pericardial Constraint.

3:10 - Dr. Henk ter Keurs: Perspective.

4:00 - 5:30 p.m. Drs. Watanabe and Church.

THURSDAY, JULY 10

8:00 - 9:00 a.m.
AHFMR Impact on Faculty of Medicine: Drs. M. Watanabe, R. Church, R. Lee, and L. Bryan in the Dean's Conference Room.

9:00 - 10:00 a.m.
Meeting with Department Heads — Drs. Cruse, Dixon, Love, Rewcastle and Veale.

10:00 - 11:00 a.m.
AHFMR Impact on Educational Programs: Drs. J. Baumer, G. Schultz and G. McDougall.

11:00 - 12:00 noon
Meeting with three Scholars (Drs. G. Blasdel, C. Frank and O. Rorstad), one Scientist (Dr. J. McGhee) and one Clinical Investigator (Dr. M. Gill).

12:00 - 1:00 p.m.
Multidisciplinary Research Groups: Drs. L. Bryan, J. Remmers and D. Roncari. The Support of Clinical Research:Dr. C. Guenther.

1:00 - 2:00 p.m. Lunch Students and Fellows.

2:00 - 3:00 p.m. Private meeting of IBR.

3:00 - 5:00 p.m. Drs. Watanabe and Church.

The Scientific Advisory Council

Selection of Members

Suggestions were sought from a variety of sources including senior highly respected Alberta academic staff, the Deans of interested faculties, nationally and internationally recognized members of the scientific community across Canada and elsewhere. A committee of three Trustees assisted in the review and selection of nominations for the consideration of the Trustees of the Foundation.

Terms of Reference

The following terms of reference were provided in the Act of Incorporation:

(1) The Scientific Advisory Council shall consist of not less than 11 members appointed by the Foundation who are representative of the national or international scientific community.

(2) The duties of the Scientific Advisory Council are as follows:
(a) to review and advise the Foundation on applications for loans or grants;
(b) to review and advise the Foundation on research projects that may be funded by the Foundation;
(c) to advise the Foundation on the publication, production and distribution of books, pamphlets, films or other productions by the Foundation;
(d) to review and advise the Foundation on the funding of research professorships or chairs at Universities in Alberta.

(3) The Scientific Advisory Council may appoint subcommittees of one or more members of the Council.

(4) The Scientific Advisory Council may in writing delegate any of the powers or duties conferred or imposed on it by or under this Act to a subcommittee appointed under subsection (3).

(5) The Scientific Advisory Council may establish one or more review panels to advise the Council with respect to the funding of research projects by the Foundation and a

review panel so established may consist of members of the Council or other individuals or both.

Duties of the Council

More specifically, the Council advises both the Trustees and the President on all policy matters dealing with the objectives of the Foundation and programs by which the Foundation might meet those objectives. Additionally, the Council comments informally on any other matter of its choosing or which is brought before it for attention.

Over the initial few years, the Council was particularly active in reviewing all the programs and procedures of the Foundation and the guidelines to programs. Additionally, it identified its role in selected programs:

— reviewing and recommending on applications to the Heritage Medical Scientist program
— reviewing all nominations to the Applications Advisory Committees
— reviewing the activities of the Applications Advisory Committees
— reviewing the recommendations developed by a special advisory committee responsible for Scholarship Renewal applications.

A number of major initiatives were advanced by the Council. The most noteworthy was the recommendation that the Foundation encourage the clustering of new scientists into multidisciplinary medical research thrusts in order to achieve the maximum impact on Alberta's medical research and contribute in a noteworthy way to the advancement of new knowledge and skills.

To achieve this end and confronted by the absence of open areas of assignable research space for multidisciplinary thrusts, the Council, with discomfort, concurred with the need for the construction of new space and recommended on its nature and management. Subsequently, the Council has received and discussed a number of university-based proposals for new thrusts for assignment on completion of the building program.

These discussions continue with the Deans of Medicine and their associates.

Regularly, the Council discusses ways and means by which clinical research might be further developed; whether defined as cellular or molecular biological research accomplished by clinical faculty or patient-based research. It deliberated and approved three special initiatives:

Clinical Traineeships
Clinical Fellowships
Clinical Investigatorships.

More recently, the activity and contribution of the Council was reviewed by both the President and independently by a subcommittee of Trustees. The Trustees were unanimous in their support recommending that a rotation of membership be initiated and that the Trustees formally request the recommendations of Council from time to time on specific issues.

In summary, the Council has been of invaluable benefit to the Foundation. Despite the problems of distance and busy timetables, its activity and distinguished membership has permitted the Foundation to obtain the objective that high standards be maintained and that locally-based decisions be minimized. It has freely and with consideration offered advice on such sensitive issues as:

— operating grant programs
— the allocation of awards to not only universities but to their affiliated institutions
— the adoption of the Technology Transfer Program.

Individual members have aided the Foundation both individually and in groups by visits to Alberta Universities and to special interest areas of the Universities.They have been invaluable providing direct advice to the President on a broad range of subjects.